

## Nanoparticle-Dendrimer Composite Ultralight Photovoltaics, Phase I

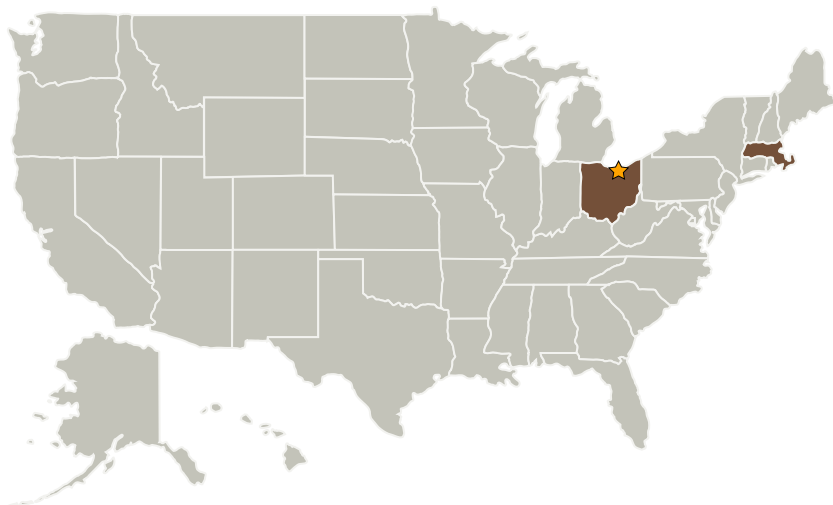


Completed Technology Project (2005 - 2005)

## Project Introduction

We propose to develop flexible solid state polymer-based solar cells that have a power density  $>1000$  W/kg and  $> 5$  year life in the space environment. The specific approach that we will employ it to make intimate organic-inorganic nanocomposites of polymeric electron donors and low-percolating nanoparticle electron acceptors. The polymeric donors have a novel hyperbranched structure which ensure a three dimensional network with high isotropic charge mobility. The high aspect ratio nanoparticle acceptors have a high intrinsic mobility and low percolation threshold. Materials are modified chemically to form intimate interpenetrating networks. The cells are formed by laminating the composite between high and low work function contacts disposed on space-qualified flexible polymer substrates. Phase I entails demonstrating cells with  $>2\%$  AM0 efficiency using this approach.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
EIC Laboratories, Inc.	Supporting Organization	Industry	Norwood, Massachusetts



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Glenn Research Center (GRC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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## Primary U.S. Work Locations

Massachusetts

Ohio

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

David Rauh

## Technology Areas

### Primary:

- TX03 Aerospace Power and Energy Storage
  - └ TX03.1 Power Generation and Energy Conversion
    - └ TX03.1.1 Photovoltaic